

# LESSON 8.3

Name \_\_\_\_\_ Date \_\_\_\_\_

## Study Guide

For use with pages 383–387

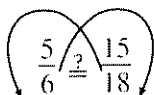
**GOAL** Write and solve proportions.

### VOCABULARY

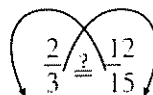
A **proportion** is an equation you write to show that two ratios are equivalent. If you multiply the numerator of each ratio by the denominator of the other ratio, you'll find the **cross products**. For the proportion  $\frac{a}{b} = \frac{c}{d}$ , the **cross products** are  $ad$  and  $bc$ . In a proportion, the cross products are equal.

### EXAMPLE 1 Checking a Proportion

Use cross products to decide whether the ratios form a proportion

a.   
 $5 \cdot 18 \stackrel{?}{=} 6 \cdot 15$   
 $90 = 90 \checkmark$

The cross products are equal,  
so the ratios form a proportion.

b.   
 $2 \cdot 15 \stackrel{?}{=} 3 \cdot 12$   
 $30 \neq 36$

The cross products are not  
equal, so the ratios do not  
form a proportion.

### Exercises for Example 1

Use cross products to decide whether the ratios form a proportion.

1.  $\frac{3}{8} \stackrel{?}{=} \frac{9}{24}$

2.  $\frac{12}{18} \stackrel{?}{=} \frac{4}{9}$

3.  $\frac{2}{5} \stackrel{?}{=} \frac{10}{26}$

4.  $\frac{3}{4} \stackrel{?}{=} \frac{15}{20}$

### EXAMPLE 2 Solving Using Mental Math

Solve  $\frac{n}{6} = \frac{16}{24}$

#### Solution

**Method 1:** Use equivalent ratios.

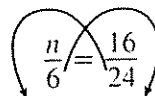
$4 \times 4$   
 $\frac{n}{6} = \frac{16}{24}$   
 $6 \times 4$

You multiply 6 by  
4 to get 24, so  
multiply 4 by 4 to  
get 16.

$4 \times 4 = 16$ , so  $n = 4$ .

**Answer:** The solution is 4.

**Method 2:** Use cross products.

  
 $24n = 96$   
 $n = 4$

Ask, "24 times what  
number equals 96?"